SENECA

Z-PC Line

EN

Z-10-D-IN-1 HW2

RS485 Modbus Module
10 Digital Inputs

Installation Manual

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SENECA s.r.l.
Via Austria, 26 – 35127 – PADOVA – ITALY
Tel. +39.049.8705355 - 8705359 - Fax +39.049.8706287
For manuals and configuration software: see www.seneca.it

CERTIFICATE N. 6113.SENE - REGISTRATION NUMBER 1107
CSQ IQNet
azienda con sistema di gestione per la qualità certificato
ISO 9001:2008

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General Specifications

- 10 digital inputs with self-powered 16V⎓ shared negative pole.
- Removable terminals with section of 2.5 mm^2
- Input protection by 600W/ms TVS transient current suppressors..
- 10 inputs with 32 bit totalizer with 2.5 kHz Max. frequency.
- Frequency, period, T_{ON} and T_{OFF} measurement for all inputs.
- Possibility to set the totalizers for forward or backward counting.
- Overflow indication for each totalizer.
- Possibility of ON-LINE configuration.
- RS485 serial communication with Modbus-Rtu protocol, maximum 64 nodes.
- 1500V~ input insulation with respect to remaining low voltage circuits.
- Power supply and serial connection wiring facilitated by means of a bus that can be housed in the DIN IEC EN 60715 guide.
- Insertion and extraction of bus without interruption of communication or system power supply.
- Communication times below 10 ms (@ 38400 Baud).
- Connection distance up to 1200 m.
- DIP-Switch settings for Modbus speed and address, and for RS485 line termination.
- All the totalizers are saved in non-volatile memory (Fe-RAM).

Technical Specifications

Inputs

Type input	Reed, Contact, Proximity PNP, NPN (with external resistor) etc.
Number of Channels	10
Maximum Totalizer frequency	2.5 kHz
U_L (state OFF)	0 – 10 V⎓, I < 2 mA
U_H (stato ON)	12 – 30 V⎓, I > 3 mA
Absorbed Current	3 mA (for each input)
Minimum pulse duration (T_{ON})	0.2 ms
Measurement errors	Frequency: 2% of the value ±1 Hz Period, Ton, Toff: 2% of the value ±1 ms
Resolution	Frequency: 1 Hz Period, Ton, Toff: 1 ms

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Power Supply

Voltage	10 – 40 V⎓; 19 - 28 V∿ 50 – 60 Hz
Consumption	Typical: 1.5 W, Max: 2.5 W

Environmental Conditions

Temperature	-20 – +65°C (-10 – +55 °C UL)
Humidity	30 – 90% non condensing
Altitude	Up to 2000 m a.s.l.
Storage Temperature	-20 – +85°C
Protection degree	IP20

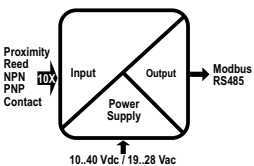
Connections

Removable 3-way screw terminals, 5 mm pitch
Rear IDC10 connector for DIN IEC EN 60715 rail

Dimensions / Box

Dimension	L: 100 mm; H: 112 mm; W: 17,5 mm
Box	Pa6, Black

Isolation 1500 V∿



Standards

The module complies with the following standards:

EN61000-6-4 (electromagnetic emission, industrial environment).

EN61000-6-2 (electromagnetic immunity, industrial environment).

EN61010-1 (safety).

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ADDITIONAL NOTES :
Use in Pollution Degree 2 Environment .
Power Supply must be Class 2.
A max 2.5 A rated fuse shall be installed near the module.

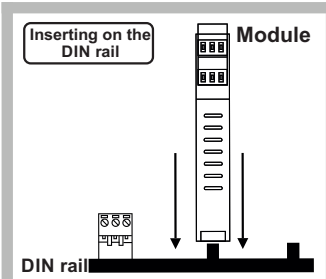
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Installation Rules

The module is designed to be installed in vertical position on a DIN IEC EN 60715 rail. In order to ensure optimum performance and the longest working life, the module(s) must be supplied adequate ventilation and no raceways or other objects that obstruct the ventilation slots. Never install modules above sources of heat; we recommend installation in the lower part of the control panel.

Inserting on the DIN IEC EN 60715 rail

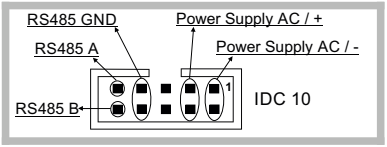
As it is illustrated in the next figure:
1) Insert the rear IDC10 connector on a DIN rail free slot (there's only one way to insert the module because of polarized connector).
2) Tighten the two locks placed at the sides of the rear IDC10 connector to fix the module.



Electrical Connections

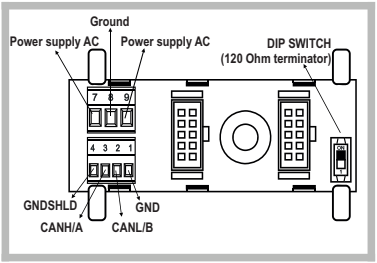
Power supply and MODBUS interface

Power Supply and Modbus interface are available by using the bus for the Seneca DIN rail, by the rear IDC10 connector or by Z-PC-DINAL2-17,5 accessory.



Rear Connector (IDC10)

In the figure the meaning of the IDC10 connector pins is showed, in the case the user decides to provide the signals directly through it.



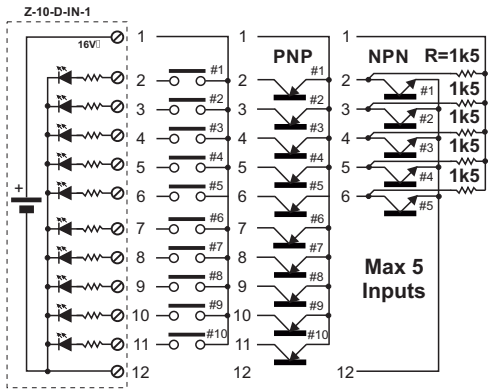
Z-PC-DINAL2-17,5 Accessory Use

In case of Z-PC-DINAL2-17.5 accessory use, the signals may be provided by terminal blocks. The figure shows the meaning and position of terminals and the DIP-switch (present on each DIN rail supports listed on Accessories) for network termination (not used in case of Modbus network).
GNDSHLD: Shield to protect the signals of the connecting cables against interference (recommended).

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Digital Inputs

REED, PROXIMITY, PNP, NPN, and contact-type sensors can be connected to the input
terminals. The power supply for these sensors can be taken directly from Terminal 1 (+16V). All the inputs are connected in shared connection to Terminal 12 (GND).
The current that flows through a closed input is approx. 3 mA.
Max frequency 2,5 KHz

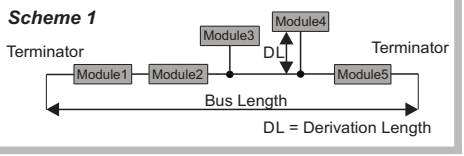


Modbus connection rules

1) Install the modules on the DIN IEC EN 60715 rail (max 120).
2) Connect the remote modules using cables of proper length. On the table the following data about the cables length are provided:
- Bus Length: Modbus network maximum length as a function of the Baud rate. It is the lenght of the cables which connect the two bus terminators modules (see Scheme 1).
- Derivation Length: Derivation line Maximum length as a function of the Baud Rate (see Scheme 1).

Bus lenght	Derivation lenght
1200 m	2 m

Scheme 1



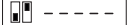
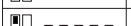
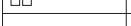
For the best performances, the use of special shielded cables is recommended (BELDEN 9841 cable for example)

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DIP-switches settings

The DIP-switches position defines the module Modbus communication parameters: address and Baud Rate. In the following figure the Baud Rate and address values are listed as a function of the DIP-switches position:

Stato dei DIP-switch

POSITION	BAUD RATE	POSITION	ADDRESS	POSITION	TERMINATOR
1 2 3 4 5 6 7 8		3 4 5 6 7 8		10	
	9600		# 1		Disabilit.
	19200		# 2		Abilitato
	38400	. . . . .	# . .		
	57600		# 63		
	From EEPROM		From EEPROM		

Note: when switches from 3 to 8 are in OFF, comunication settings are retrieved from EEprom

MODBUS Registers

Detailed information about the list of MODBUS registers
and their functions can be found, in English language only,
within the **USER MANUAL** available in the product download section:
http:\\www.seneca.it\products\z-10-d-in

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Frontal panel LEDs Signallings

LED	STATUS	*Meanings of LED*
PWR Green	On	Power supply presence.
FAIL Yellow	Blinking	error settings.
FAIL Yellow	On	Malfunction or fault.
RX Red	Blinking	Receiving data from RS485.
RX Red	On	Verifying the connection.
TX Red	Blinking	Sending data to RS485.
TX Red	On	Verifying the connection.

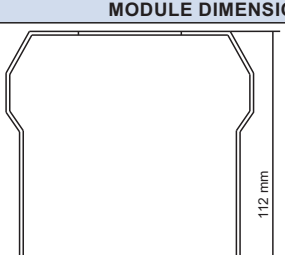
Default Conditions

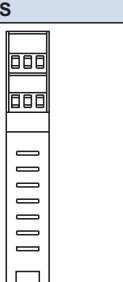
Module factory settings parameters:	
All DIP-Switch position:	OFF
Communication parameters Modbus Protocol:	38400 8,N,1 Addr. 1
Reverse input status:	DISABLED
Digital filter:	3 ms
Totalizers:	UP Counter
Modbus latency time:	5 ms

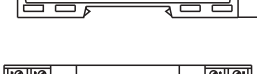
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MODULE LAYOUT

MODULE DIMENSIONS







FRONT PANEL



Variation of standard parameters are possible by using configuration software (see: www.seneca.it).
For more information about a list of all register and their function refer to the USER manual.

Decommissioning and Disposal



Disposal of Electrical & Electronic Equipment (Applicable throughout the European Union and other European countries with separate collections programs). This symbol, found on your producr or on its packaging, indicates that this product should not be treated as household waste when you wish to dispose of it. Instead, it should be handed over to an applicable collection point for the recycling of electrical & electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences to the environment and human health, which could otherwise be caused by inappropriate disposal of this product. The recycling of materials will help to conserve natural resources. For more detailed information about the recycling of the product, please contact your local city office, waste disposal service of the retail store where you purchased this product.

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